

DR. GEORGE GORE, F.R.S.

DR. GEORGE GORE, F.R.S., whose death was announced last week, was born at Bristol in 1826, the son of a small cooper. First as errand-boy and afterwards as cooper's apprentice, he devoted himself to whatever scientific studies came within his reach.

He went to Birmingham in 1851, and made his home there for the remainder of his life. His occupations were numerous and varied; at one time he was a practitioner in medical galvanism, at another chemical expert in a phosphorus factory, and again a lecturer in physics and chemistry at King Edward's School. He always, however, employed himself in original investigation, more especially in the province of electro-metallurgy, whenever his other work would allow, and his knowledge of electrochemical processes enabled him to be of the greatest service to the electroplating industry in the town of his adoption.

His researches on hydrofluoric acid and the fluorides, definitely proving the analogy of these compounds with those of chlorine, are well known to chemists, and in 1865 he was elected to the Fellowship of the Royal Society in recognition of the value of his work. It may be noted in this connection that many years later he was only just anticipated by Moissan in the isolation of fluorine.

In 1877 the honorary degree of LL.D. was conferred on him by the University of Edinburgh as an acknowledgment of his services to science. Some years later he declined the offer of a knighthood, but in 1891 he accepted a Civil List pension.

From the age of thirteen he had had to rely upon himself for his own education, which occupied all his spare time at a period when he was earning his living by arduous labour. Hence it is not surprising to find that one of his characteristics was an extraordinary degree of energy, which, making him one of the greatest of workers, enabled him to accomplish very much, even for a lifetime of close upon eighty-three years. His was a restless mind, constantly seizing upon fresh subjects for research, and the result of this may be seen in the length of the list of publications associated with his name in the Royal Society's catalogue. It may be, indeed, that this very quality, by distributing his energies, was an obstacle to achievements of still greater importance which might have ensued upon the concentration of an intellect combining so much ingenuity and so great a capacity for work.

He was strongly impressed with the necessity for State endowment of scientific research, and was partly instrumental in procuring for the Royal Society the Government grant of 4000*l.* a year for this purpose.

In addition to his contributions to learned societies, he published a text-book on "The Art of Electro-metallurgy," and a volume on "The Electrolytic Separation of Metals"; he also wrote a treatise on "The Art of Scientific Discovery." His mind always had a bent for philosophy, which expressed itself more especially in his later years. He was an unswerving materialist, and his views may be gathered from his recently published work on "The Scientific Basis of Morality."

G. A. S.

PROF. J. M. PERNTER.

AS announced with deep regret last week, the death of Hofrat Prof. Josef Maria Pernter took place after a long illness at Arco, South Tyrol, on December 20. From 1897 until compelled in the early part of last year to abandon his work, Pernter was professor of meteorology and geodynamics in the University of Vienna, and director of the Austrian

Zentralanstalt for those sciences. The institute is situated in the Hohe Warte, about three miles from the centre of the city of Vienna.

He was born on March 15, 1848, in Neumarkt, Tyrol. In 1864 he entered the novitiate of the Society of Jesus, and became successively professor of philosophy at Presburg, professor of physics and mathematics at Kalócsa, Hungary, and at Kalksburg. He left the society in 1877, and in 1882 became an assistant in the Central Meteorological Institute of Vienna. In 1890 he was made professor of cosmical physics in Innsbruck, but returned to Vienna as director and professor upon the retirement of Hann. Throughout his life he was a sincere churchman, and occupied a position of great influence among Catholic university students.

His best known work is his "Meteorological Optics," an admirable and exhaustive treatise the publication of which is not yet completed. And apart from his official work as director of the Austrian Meteorological Service, there are many valuable papers by him on various branches of meteorology to be found in meteorological journals or in the publications of the Vienna Academy, of which he was a corresponding member. His friends will probably remember him best as a controversialist of the best kind. Himself full of vigour, energy and "Geist," he possessed the power of putting his ideas with perfect fairness into the most lucid and vigorous language, both in conversation and in print. His contributions to the discussion of the question of the cannonade against hail concluded with a masterly summary in "Das ende des Wetterschiessen's" in the *Meteorologische Zeitschrift* of 1907.

He was an active member of the International Meteorological Committee, and presided over the conference of directors of meteorological institutes and observatories at Innsbruck in 1905. His work, both official and unofficial, was characterised by great thoroughness and vivacity.

In recent years he suffered most poignant family bereavement. He lost his young daughter in 1904 and his wife in 1906, and from these losses he never recovered. He leaves an only son, who is still of student age.

NOTES.

M. P. VILLARD has been elected a member of the Paris Academy of Sciences, in the section of physics, in succession to the late M. Mascart.

PROF. A. BÉHAL, of the École supérieure de Pharmacie of Paris, has resigned the general secretaryship of the Paris Chemical Society. He will be succeeded by M. Freundler, of the faculty of science in the University of Paris.

MR. ARTHUR H. SMITH has been appointed keeper of the department of Greek and Roman antiquities in the British Museum, in succession to Mr. Cecil H. Smith, who was recently appointed director of the Victoria and Albert Museum.

At the initiative of the Association internationale de l'Institut Marey, a subscription list has been opened for the erection of a monument to the late M. E. J. Marey. We learn from *La Nature* that donations may be sent to M. Carvallo, at the Institut Marey, Parc des Princes, Boulogne-sur-Seine. A committee of management has been formed, with M. Chauveau as chairman.

DR. H. W. WILEY, the chief of the bureau of chemistry in the U.S. Department of Agriculture, is directing atten-

tion to the need of isolating consumptives on railway journeys, particularly in travel by sleeping-car across the American continent. He is arranging apparatus to take samples of the air breathed in these cars for the purpose of analysis in the interest of the public health.

A GRATIFYING sign of the increased interest in hygiene in America is reported from Tuskegee, Alabama, where a meeting of the National Negro Anti-tuberculosis Congress was held on December 19, 1908. It was decided to begin the organisation of anti-tuberculosis committees in all negro lodges and business leagues. Hitherto, owing largely to the neglect of normal precautions, the mortality from consumption has been exceptionally high among the coloured population.

THE death is announced of Prof. Richard Pischel, who had occupied the chair of Sanskrit in the University of Berlin since 1902, and was elected a member of the Prussian Academy of Sciences in 1903. Prof. Pischel was born on January 18, 1849, and took his degree at Breslau in 1870. He was for ten years professor of comparative philology at Kiel, and was afterwards at Halle, from whence he was called to Berlin. His "Vedische Studien," published in conjunction with Geldner (1889-1901), played an important part in vindicating the specifically Indian character of the Rig-Veda.

THE Paris correspondent of the *Times* states that on December 31, 1908, Mr. Wilbur Wright accomplished at Le Mans a flight lasting 2h. 20m. 23.2s., the distance covered being officially returned at nearly 125 kilometres. A year ago Mr. Farman flew 1093 yards in 88 seconds, and now Mr. Wright has traversed 136,106 yards in 8423 seconds. There has thus been a decided advance both as regards duration of flight and distance covered. A Reuter message from Brussels states that King Leopold's prize of 25,000 francs (1000l.) will be awarded this year to the author of the best work on aerial navigation.

THE Berlin correspondent of the *Globe* states that a series of interesting experiments is being carried out by the German military authorities with regard to the employment of wireless telegraphy by balloons. These experiments are being made by means of registering balloons fitted with a wireless-telegraphy apparatus. When a message has been received by the balloon an ingenious mechanism opens the valve, and the balloon descends. The military authorities hope to be able soon to extend the working of wireless telegraphy to the military steerable balloons.

THE summary of the weather issued by the Meteorological Office for the week ending January 2 gives some interesting temperatures which occurred in the recent severe frost, to which reference was made in our issue last week. The summary states that the lowest of the minima were generally registered on December 29 or 30, and were so low as 3° at Swarraton, near Worthing, on December 30, 5° in the Midland counties, and 7° at Cambridge. Temperatures at other than the usual stations are also given. At Liphook, in Hampshire, about thirteen miles to the south of Aldershot, the thermometer in the screen fell to 1° below zero on December 30, at Buxton and Epsom to *plus* 4°, and at Great Billing, Northampton, to *plus* 6°. The thermometer exposed on the snow at Tunbridge Wells fell to 2° below zero, and at Epsom to 8° below zero. The temperature at Greenwich on the morning of December 30 fell to 12° in the screen, and to 2° on the grass. There have only been four winters during the last fifty years in which the sheltered thermometer has fallen below 12° at Green-

wich, and the lowest temperature recorded is 6°·6, on January 5, 1867. Subsequent to the close of the frost on December 30 the weather has been unusually mild for the time of year over the entire kingdom, and the thaw was both sudden and complete.

THE weather statistics kept at Greenwich Observatory during 1908 show the year to have been generally one of normal conditions. The aggregate measurement of rain was 23·8 inches, which is 0·3 inch less than the average of the previous half-century. The largest measurement in any month was 3·66 inches, in July, which is 1·26 inches more than the average; the other months with an excess of rain were March, April, June, August, and December. The month of least rainfall was November, with 0·76 inch, which is 1·46 inches below the average; the deficiency in September was 0·93 inch, and in October 0·81 inch, giving a total deficiency of 3·20 inches for the three autumn months. There were in all 155 days with rain, the greatest number in any month being twenty, in December, and the least six, in June. Snow fell on twenty-three days during the year, and eight of these occurred in March. The mean air temperature for the year was 50°·1, which is in precise agreement with the average. The highest mean for any month was 63°·1, in July, and June and August each had the mean above 60°. The coldest month was January, with the mean 36°·3, which was 2°·1 below the average. The range of temperature was 72°, the absolutely highest reading being 84°, in July, and the lowest 12°, in the recent frost on December 30. Frost occurred in all on forty-four nights, and thirty-two of these occurred from January to March. The temperature was above the average on forty-six nights in the two months October and November, and there were only three nights with frost. The duration of bright sunshine was 1633 hours, which is 132 hours in excess of the average for the previous ten years; the most sunny month was June, and the least sunny December.

MR. F. L. DAMES, Steglitz, Berlin, has sent us copies of catalogues of works on entomology (No. 97) and botany (No. 98).

THE early development of the polycladian Planocera is discussed by Mr. F. M. Surface, who has sent us a copy of his paper, in the Proceedings of the Philadelphia Academy for December, 1907 (issued February, 1908). As the paper reaches us somewhat late, we are unable to refer to its contents.

MESSRS. MACMILLAN AND CO. have just published another of their series of coloured wall-pictures of farm animals, this being the portrait of the shire stallion champion "Hendre Royal Albert." This animal, which is a bay, with a white "blaze" and white "stockings," has been finely depicted by Mr. J. Macfarlane, the painter.

IN an article in the December (1908) number of *Naturen* Mr. O. Nordgaard is led to the conclusion, from the enormous numbers of flint-implements to be met with in certain parts of the country, that during the early human period Norway possessed a Cretaceous formation, which has now been denuded away.

IN NATURE for March 21, 1908, was published a notice, by Dr. P. L. Sclater, of a pamphlet by Mr. W. Rodier on the best means of exterminating rabbits in Australia, while a second notice was communicated by Mr. W. B. Tegetmeier to our issue of November 13, 1902. Both notices are commendatory of the plan, which consists in killing off the females, and thus causing a preponder-

ance of males, which will kill a considerable proportion of the largely diminished number of young. Mr. Rodier has favoured us with a new edition of his pamphlet, entitled "The Rabbit Pest in Australia," published in Melbourne.

THE effect of alkaloids on the early development of the echinoderm *Toxopneustes variegatus* forms the subject of a paper by Mr. S. Morgulis published as No. 14 of Contributions from the Bermuda Biological Station. Previous experiments have shown that the addition to the water of small quantities of pilocarpine hydrochloride results in the increase of the size of the embryos in certain echinoderms, and it was thought that a further study of such abnormally large embryos might contribute information on the problem of growth. The new experiments did not yield the anticipated results, but the author nevertheless gives a summary of his work, which may not be devoid of interest.

SOME interesting experiments on the action of radium rays on developing plants are described by Prof. C. S. Gagee in the December (1908) number of the *American Naturalist*. The general result of these is to demonstrate that radium rays act as a stimulus to plants. If this stimulus ranges between a minimum and an optimum point, an excitation function is the result, but when the optimum point is passed there ensues a depression of function, terminating in complete inhibition of growth as the strength or duration of the treatment is maintained above the point in question. The results of experiments on germinating lupin-seeds, Timothy grass, &c., are illustrated by means of photography as well as by diagrammatic curves.

COLONY-FORMATION among rotifers, according to Mr. F. M. Surface, to whom we are indebted for a separate copy of a paper from vol. xi., No. 4, of the Biological Bulletin, on the formation of new colonies in *Megalotricha alboflavicans*, is not common. In certain species of the family Melicertidae the individuals do, however, become aggregated into colonies, the young being hatched as free-swimming units. In the case of the species described, these young do not leave the colony singly, but come together into a swimming ball which reacts positively to light. Under certain conditions this ball subsequently breaks up into free individuals, which again collect into a permanent colony. In the formation of these colonies the mucus-like secretion of a gland plays an important part.

AFTER the death of the great embryologist Prof. K. E. von Baer, there was found among his papers an unpublished biography of Cuvier, which is of very considerable interest as being an account of a great naturalist by one of his own contemporaries. The memoir was published, under the editorship of Prof. Ludwig Stieda, of Königsberg, in the *Archiv für Anatomie* for 1896, and of this a French translation has appeared in the *Annales des Sciences naturelles, Zoologie*, for 1908. This biography, together with Eckermann's "Conversations avec Goethe dans les dernières Années de sa Vie," published at Magdebourg in 1848, forms the subject of an article by Dr. E. Trouessart entitled "Cuvier et Geoffroy Saint-Hilaire d'après les Naturalistes Allemands," of which the first part appears in the December (1908) issue of *La Revue des Idées*. The first-named of the two memoirs is somewhat severely criticised, the claim put forward by von Baer that Cuvier was in part a German by descent apparently exciting the ire of the French reviewer. A second article in the serial cited is devoted to a review, by Mr. Etienne Rabaud, of de Vries's mutation theory.

MR. C. J. HERRICK has favoured us with separate copies of two papers from vol. xiii., No. 2, of the *Journal of Comparative Neurology and Psychology*, one on the phylogenetic differentiation of the organs of smell and taste, and the other on the morphological subdivision of the brain. Smell and taste, as he points out, are the only two senses in vertebrates the receptive organs of which are adapted to respond directly to peripheral chemical excitation; and he concludes that the agencies which acted to produce these senses are to be sought primarily, not in the stimuli calling forth the reflexes, but rather in the character of the response evoked by the stimulus. In the second paper it is pointed out that whereas the subdivision of the human brain into regions, as made by the early anatomists on the foundation of gross external form, has a certain functional as well as morphological basis, when the attempt was made to study the regions thus named from a comparative point of view, the morphological defects of the scheme became at once apparent. Several alternative schemes have been suggested, but as none of these, in the opinion of the author, is satisfactory, he proposes a new one for the entire nervous system, which is split up into four primary divisions, viz. systema nervorum sympathicum, s. n. cerebro-spinale, s. n. periphericum, and s. n. centrale. For the divisions of the brain itself we must refer our readers to the original paper.

THE second Bulletin of the Sleeping Sickness Bureau, edited by the director, Dr. A. G. Bagshawe, contains a summary of the results of the work hitherto published by investigators upon certain aspects of the sleeping-sickness problem, supplemented by statements based upon the editor's own experience in Africa, and by conclusions of a practical nature deduced from the array of facts brought together. The chief subjects dealt with in the present number are diagnosis and symptoms of human trypanosomiasis, transmission of *Trypanosoma gambiense*, incubation period of human trypanosomiasis, toxin-formation in trypanosome-infection, and recent work on treatment. With reference to the vexed question of the transmission of sleeping sickness, it is concluded that "in devising measures for prevention we may disregard other species and concentrate our attention and energies on *Glossina palpalis*." This publication is especially valuable for those who are investigating sleeping sickness far from centres of civilisation and scientific libraries, and require information with regard to the results of other workers in the same field.

A SYNOPSIS of the Philippine species of Freycinetia (Pandanaceæ), prepared by Mr. E. D. Merrill and published in the botanical series of the *Philippine Journal of Science* (No. 5), assigns twenty-four species to the islands, a number considerably greater than is found in any other region; moreover, they are all endemic. Of the species of Philippine oaks, which are summarised by the same author, most are endemic, but four species are common to the Celebes or Borneo. It is noted that one, a new species, sheds its bark in thin flakes similarly to the ordinary species of birch.

QUOTING from his experience of insect pests in Indian forests, Mr. E. P. Stebbing communicates to the *Indian Forester* (November, 1908) cogent arguments regarding the danger of pure forests, and points out the necessity for taking into consideration the dangers of insect and plant pests before drawing up forest working plans. Special observations in the case of an attack by bark-borers on deodar showed that the ravages were considerably greater where the deodar formed pure forest than on

areas where the deodar was mixed with oak. Sometimes, as in the case of a species of *Tomicus* bark-beetle infesting blue pine and spruce, more than one of the principal trees in a mixed forest is attacked.

THE notes on annual flowers by Mr. A. Watkins published in the *Journal of the Royal Horticultural Society* (vol. xxxiv., part ii.) contain hints for the amateur gardener as well as queries for the plant breeder. The author observes that annuals well repay extra attention, especially in the matter of sowing and transplanting so as to give them plenty of room. As a puzzle in variation, reference is made to the Countess Spencer variety of sweet-pea, from which for a long time no fixed type could be obtained; the explanation offered attributes this difficulty to a period of variability for the strain. As a successful instance of selection, Mr. Watkins mentions his production of the *Mandarin erecta compacta* variety of *Eschscholtzia*.

THE report on the operations of the Department of Agriculture, Madras Presidency, for the official years 1906-7 and 1907-8 shows that steady progress is being made in improving the native husbandry. Experiments are recorded on the growth of paddy, the most valuable and important crop of the Presidency, of sugar-cane, jute, and agave. There are numerous experiments on cotton, some of the famous black cotton soils occurring in this region, and on methods of irrigation. The department keeps in touch with the native cultivator by sending out agricultural inspectors to help the ryots in their cultivation of the various crops; it also distributes seed superior to that in common use, and, in certain cases, gives premiums by way of encouragement to those natives who succeed with the improved methods.

THE Bureau of Soils of the United States Department of Agriculture has recently issued a Bulletin (No. 51), by Messrs. Patten and Gallagher, dealing with the absorption of vapours and gases by soils. The problem is very intricate, and is not likely to be solved until more light has been thrown on the constitution of colloids; in this respect it resembles many other soil problems. Although the present publication does not carry us much further, it serves a useful function in collecting a good deal of scattered work, and directing attention to a problem of great practical and scientific importance.

BULLETIN No. 80 of the North Dakota Agricultural College Experiment Station gives descriptions of the common weeds of North Dakota, and of the methods by which they may be eradicated. It is recommended that recourse should be had to spraying with solutions of either ferrous sulphate, copper sulphate, or sodium arsenite. Sodium arsenate cannot be recommended, since it does not dissolve with sufficient readiness. Spraying is not an uncommon practice in England, and it is on the increase; the necessity of saving labour compels the modern farmer to do by chemical means what his predecessor did by hand.

THE report of the director of agriculture of the Federated Malay States for the year 1907 which has just come to hand shows continued progress in many directions. The climate is probably unsurpassed for rapid growth of vegetation, but these conditions are also favourable to insect and fungoid pests, and the appointment of a Government mycologist will prove a useful step. There is, however, no chemist as yet. The agricultural work appears to be on useful lines, and calculated to aid materially the development of these States. Work has

been done on padi and on cocoanuts, both highly valuable crops, but perhaps the most striking advance is seen in rubber cultivation. The acreages in the Federated Malay States (exclusive of those in Johor, Malacca, and Province Wellesley) have been as follows:—

Year	Acreage	Year	Acreage
1897	345	1903	11,239
1898	1,761	1904	19,239
1899	3,227	1905	43,338
1900	4,693	1906	85,492
1901	5,965	1907	126,235
1902	7,239		

There was in 1907 a marked fall in the price of rubber, which, however, only stimulated the planters to improve their methods and decrease the cost of production. The industry is very profitable; even the lowest price yet reached for plantation rubber is more than 100 per cent. above the cost of production. Experiments are in hand to discover still better methods of working and of coping with the root fungus *Fomes semitostus* and the termite *Termes gestroi*, which are at present the worst rubber pests.

PROF. T. J. J. SEE contributes to the Proceedings of the American Philosophical Society a further paper dealing with his interpretation of the cause of earthquakes and the origin of mountain ranges. The paper is illustrated with a series of very striking relief maps of the continents, taken from Frye's "Geography," which are intended to illustrate the author's contention that the highest mountain ranges border the deepest oceans. The series of memoirs by Prof. See, of which this is the last, may be regarded as part of the modern revolt against the doctrine which regarded the earth as an inert mass cooling by radiation into space, and attributed all changes which have taken place in it as due to secular contraction. We wonder whether his last paper may not also be an indication of a return to the fashion of the lengthy titles which delighted our forefathers of a century ago.

An excellent custom prevails in America, which might well be imitated in other countries, that just when a special piece of scientific work is needed someone is always ready to defray the cost. This is the case with the investigation of the races of the Philippine Islands, which is due to the liberality of Mr. R. F. Cummings, of Chicago. The report on the Tinggian tribe by Mr. F. C. Cole, which is the first of the series, amply justifies the expenditure on the work. The Tinggians are a fairly civilised tribe, practising rice farming on a large scale, and occupying the subprovince of Abra. They are ruled by a tribal council, before which everyone, including all duly married women, may bring their grievances. They revere a sky spirit, known as Kadaklan, but their religious rites are mainly devoted to the propitiation of the evil spirits which infest the earth. These rites are in a large measure of the shamanistic type, and in their domestic ceremonies sympathetic magic plays a leading part. Special attention is paid to the propitiation of the spirits of the dead, for whom blankets and other things likely to be wanted in the other world are hung on a rope suspended over the corpse. Marriage is said to be prohibited between blood relations, and it is alleged that there is no clan system, an assertion which, on the analogy of other races in a similar grade of culture, further investigation will perhaps correct.

THE September (1908) number of the *Philippine Journal of Science* contains a classification of the racial types found among the students at the University of Michigan,

the percentage frequency in each class being stated. It is suggested that the numerous composite types may be explained by the action of inheritance from three primary types, in accordance with the lines laid down by Mendel.

L'Aéro Mécanique is the title of a new monthly paper published at Brussels (Rue royale 214). No. 5 before us contains, among other articles, one by Captain de Vos on the much-vexed question of the flapping wing of the bird, and extracts from current journals, patents, and so forth.

THE *Revue générale des Sciences* reproduces in its issue for December 15, 1908, the address given by Prof. H. Poincaré to the Mathematical Congress at Rome on "The Future of Mathematics." In the introductory part, which precedes the discussion of special regions of mathematical study, the author discusses the aims and objects of the pure mathematician, the reasons for his insistence on rigour and elegance in his proofs, and his relationship to the engineer.

THE equilibrium of a flexible string forms the subject of a paper in the Transactions of the American Mathematical Society, ix., 4, by Prof. E. B. Wilson. It is pointed out that the ordinary solutions for the cases of a rectilinear field, whether parallel or central, fail to lead to interesting problems when the string has a free end, but the paper shows that there is a large class of cases, which may be explicitly integrated by quadratures, where this objection does not apply.

A HISTORY of the origin of the theory of the æther is contributed by Dr. Léon Bloch to the *Revue générale des Sciences*, xix., 22. It deals very largely with the theories of Newton and Hooke. The author shows that as new physical discoveries have taken place, the theory of the æther has undergone a continual process of evolution, and he predicts that the same will take place in the future. A rigorous dynamical theory of this medium which does not admit of modification in the light of new discovery cannot be regarded as final.

PROF. E. B. WILSON, writing in the Bulletin of the American Mathematical Society (December, 1908), discusses the analogy between statistical mechanics and hydrodynamics, an analogy primarily based on the identity between the Eulerian equation of continuity and the corresponding relation between the differential coefficients of momenta and coordinates. According to this view, it is obvious that the determinantal relation of the kinetic theory represents the Lagrangian equation of continuity. The purpose of the paper is to examine whether the equations of motion, and in particular those of irrotational motion, have any analogues on the dynamical side. The search does not appear to lead to any results of great importance so far.

MESSRS. BURROUGHS WELLCOME AND CO. have sent us a copy of Wellcome's "Photographic Exposure Record and Diary" for the year 1909, and an examination of it shows that in this handy little book the owner possesses a store of practical information in the smallest compass for one shilling. In this year's issue a further attempt has been made, and we think with very successful results, to condense statements to the minimum number of words, and this has allowed extra matter on other subjects to be inserted. A new feature of the article on exposure is the insertion of two tables dealing with the relative speed of bromide papers and lantern plates. These should be found very useful, because if the user knows the correct

exposure for any one of these, that for any other can be determined at a glance. Other items here tabulated are the various exposures of interiors, copying and enlarging, moving objects, &c., and an excellent list of plate speeds, brought up to date, is added. Perhaps the main feature of this pocket-book is the exposure calculator at the end, which by this time has become of such general use. In this issue the series of illustrations of characteristic subjects is printed on a separate card and placed in the pocket of the book, the use of the calculator being thus facilitated.

WE have received from Messrs. John J. Griffin and Sons, Ltd., of Kingsway, London, a conveniently arranged and profusely illustrated catalogue of models for teaching machine construction and drawing, pattern making and foundry practice, building construction, and mining operations. Teachers of these subjects should find the catalogue of great assistance and very suggestive in developing the practical side of the instruction they give.

WHITAKER'S "Peerage, Baronetage, Knightage, and Companionage for the Year 1909" is now available. The character of this useful work of reference is too well known to make any extended description of its contents necessary. A new feature of the present issue is an addition to the introduction in the form of an "Official Glossary," which provides useful information to persons who are not experts in the various departments with which the volume deals. The work includes an extended list of the Royal Family, the peerage with titled issue, dowager ladies, baronets, knights and companions, home and colonial bishops, and an index to country seats.

MESSRS. ARCHIBALD CONSTABLE AND CO., LTD., have published a revised and abridged edition of "The Life Story of Sir Charles Tilston Bright, Civil Engineer; with which is incorporated the Story of the Atlantic Cable and the First Telegraph to India and the Colonies." The present volume has been prepared by Mr. Charles Bright alone, who, in the task of writing the original work, was assisted by his uncle, Mr. E. B. Bright. The book was reviewed at length, soon after its original appearance, in NATURE for October 26, 1899 (vol. lx., p. 613). This abridgment appears appropriately, since 1908 was the fiftieth anniversary of the Atlantic cable, and the short account of the work of so exceptionally able, energetic, and enthusiastic a man as the late Sir Charles Bright should be welcome to many readers. The price of the new issue is 12s. 6d. net.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN JANUARY:—

- Jan. 7. 13h. 21m. to 16h. 41m. Transit of Jupiter's Satellite III. (Ganymede).
 10. 19h. Jupiter in conjunction with the Moon. (Jupiter $4^{\circ} 11' S.$).
 11. 14h. 23m. to 15h. 32m. Moon occults ν Virginis (mag. 4.2).
 22. 9h. 41m. to 13h. 32m. Transit of Jupiter's Satellite IV. (Callisto).
 23. 9h. 12m. Minimum of Algol (β Persei).
 25. 5h. 59m. to 7h. 2m. Moon occults 30° Piscium (mag. 4.7).
 „ 7h. 44m. to 8h. 37m. Moon occults 33° Piscium (mag. 4.6).
 26. 6h. 1m. Minimum of Algol (β Persei).
 „ 16h. Mercury at greatest elongation, $18^{\circ} 25' E.$
 30. 20h. Mercury in conjunction with Uranus. (Mercury $0^{\circ} 21' N.$).